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CLAIMS

1. A congestive heart failure monitor comprising an impedance measuring unit (7; 30, 32) adapted to measure the impedance Z between at least two electrodes (2, 4; 6, 8; 10, 12; 17, 18; 20, 22, 24, 26) intended to be implanted in a patient such that a change in the left atrium volume results in a change of the measured impedance, and analysing means (7, 9; 36, 38, 40, 42, 44) for analysing said measured impedance for detecting an incipient congestive heart failure (CHF) **characterized** in that said analysing means comprise a quotient determining means (40) provided to determine the quotient between the impedance minimum and maximum values during a cardiac cycle, and in that said analysing means are adapted to analyse said quotient to detect CHF.

2. The monitor according to claim 1, **characterized** in that said analysing means comprise an averaging means (36, 38) provided to form a mean value of said measured impedance during a plurality of cardiac cycles, and in that said analysing mans are adapted to analyse said mean value to detect CHF.

3. The monitor according to claim 2, **characterized** in that a first comparison means is provided to compare said impedance mean value with a predetermined impedance threshold value, said analysing means being adapted to detect CHF from the result of said comparison.

4. The monitor according to claim 1, **characterized** in that said analysing means comprise quotient averaging means provided to form a mean value of said quotient during a plurality of cardiac cycles, and in that said analysing means are adapted to analyse said mean value to detect CHF.

5. The monitor according to claims 1 or 4, **characterized** in that a second comparison means is provided to compare said quotient or said mean value of the quotient with a predetermined quotient threshold value, said analysing means being adapted to detect CHF from the result of said comparison.

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6. The monitor according to claim 3, **characterized** in that said averaging means is adapted to form a floating mean value of the measured impedance during a predetermined number of preceding cardiac cycles for use as said impedance threshold value.

7. The monitor according to claim 5, **characterized** in that said quotient averaging means are adapted to form a floating mean value of said quotient determined during a predetermined number of preceding cardiac cycles for use as said quotient threshold value.

8. The monitor according to any of the claims 1 – 7, **characterized** in that said analysing means are adapted to analyse said impedance mean value and said quotient to detect CHF.

9. The monitor according to claims 3 and 5, **characterized** in that said first and second comparison means are one and the same comparison means (42).

10. The monitor according to any of the preceding claims, **characterized** in that said electrodes (6, 8; 10, 12) are designed for implantation in the right and left atria, respectively.

11. The monitor according to any of the claims 1-9, **characterized** in that said electrodes (2, 4; 17, 18) are designed for implantation in the right atrium and left ventricle.

12. The monitor according to any of the claims 1- 9, said monitor being implantable, **characterized** in that one of said electrodes (18) is designed for implantation in the left atrium and the other electrode is formed of an outer capsule of the monitor.

13. The monitor according to any of the claims 10 - 12, **characterized** in that said electrodes (12; 18; 16) for implantation in the left atrium and the left ventricle are designed for implantation in a coronary vein.

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14. The monitor according to claim 1, **characterized** in that said impedance measuring unit comprises a measuring circuit in the form of a synchronous demodulator for obtaining both the real and imaginary parts of the impedance (fig. 6).

15. The monitor according to claim 14, **characterized** in that said impedance measuring unit is adapted to determine the impedance phase angle and in that said analysing means are adapted to analyse the phase angle for detecting an incipient CHF.

16. A multisite heart stimulator, **characterized** by a monitor according to any one of the preceding claims.

17. The stimulator according to claim 16, **characterized** by a control unit provided to control the stimulation of the patient's heart in response to an output signal received from said monitor and representing the results of the analysis of the measured impedance, in order to optimize hemodynamics.
